

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-23. (Cancelled)

24. (New) A method comprising:

receiving a loop avoidance protocol packet at a port of a provider network device configured to perform packet switching; and

if the port is coupled to a customer network:

if the device is a root bridge for the provider network, processing the loop avoidance protocol packet based on a customer loop avoidance protocol instance associated with the port; and

if the device is not the root bridge for the provider network, flooding a modified loop avoidance protocol packet to one or more ports of the provider network device that are coupled to the provider network, the modified loop avoidance protocol packet identifying the provider network device and a customer network device that sent the loop avoidance protocol packet.

25. (New) The method of claim 24 wherein the flooding comprises:

modifying a destination address of the loop avoidance protocol packet to identify the customer network device that sent the loop avoidance protocol packet, the modifying creating the modified loop avoidance protocol packet;

appending to the modified loop avoidance protocol packet information identifying the provider network device; and

flooding the modified loop avoidance protocol packet to the one or more ports of the provider network device that are coupled to the provider network.

26. (New) The method of claim 24, further comprising:

if the port is not coupled to the customer network, processing the loop avoidance protocol packet based on a provider loop avoidance protocol instance associated with the port.

27. (New) The method of claim 24 wherein the loop avoidance protocol packet comprises a bridge protocol data unit (BPDU).
28. (New) The method of claim 24 wherein
the provider loop avoidance protocol instance comprises a first spanning tree protocol (STP) instance; and
the customer loop avoidance protocol instance comprises a second STP instance.
29. (New) The method of claim 24 wherein the flooding comprises tunneling the modified loop avoidance protocol packet to the root bridge.
30. (New) The method of claim 25 wherein the appending further comprises appending one or more of:
a payload type;
a port ID corresponding to the port of the provider network device; and
an address of the provider network device.
31. (New) The method of claim 24, further comprising:
if the loop avoidance protocol packet indicates a topology change, enabling fast-aging of learned network device addresses.
32. (New) A method comprising:
receiving a first packet at a first port of a first provider network device configured to perform packet switching, the first packet comprising a loop avoidance protocol packet and
identifying a second provider network device that received the loop avoidance protocol packet from a customer network, the first packet identifying a customer network device that sent the loop avoidance protocol packet;

if the first provider network device is not a root bridge for the provider network, flooding the first packet to one or more ports of the provider network device that are coupled to the provider network; and

if the first provider network device is the root bridge for the provider network, processing the loop avoidance protocol packet based on a customer loop avoidance protocol instance associated with a second port of the second provider network device that received the loop avoidance protocol packet from the customer network.

33. (New) The method of claim 32, further comprising indicating an error if the first port is coupled to the customer network.
34. (New) The method of claim 32 wherein the loop avoidance protocol packet comprises a bridge protocol data unit (BPDU).
35. (New) The method of claim 32 wherein the customer loop avoidance protocol instance comprises a spanning tree protocol (STP) instance.
36. (New) The method of claim 32 wherein the flooding comprises tunneling the first loop avoidance protocol packet to the root bridge.
37. (New) The method of claim 32 wherein the loop avoidance protocol packet comprises:
a destination address identifying a customer network device; and
a payload portion comprising information identifying the second provider network device that received the loop avoidance protocol packet from the customer network, the information comprising:
a payload type;
a port ID corresponding to the second port; and
an address of the second provider network device.
38. (New) An apparatus comprising:

a memory; and

a module configured to:

- receive a loop avoidance protocol packet at a port of the apparatus, the apparatus configured to perform packet switching and coupled to a provider network; and
- if the port is coupled to a customer network:

- if the device is a root bridge for the provider network, process the loop avoidance protocol packet based on a customer loop avoidance protocol instance associated with the port; and

- if the device is not the root bridge for the provider network, flood a modified loop avoidance protocol packet to one or more ports of the provider network device that are coupled to the provider network, the modified loop avoidance protocol packet identifying the provider network device and a customer network device that sent the loop avoidance protocol packet.

39. (New) The apparatus of claim 38 wherein the module is further configured to flood the modified loop avoidance protocol packet by:

- modifying a destination address of the loop avoidance protocol packet to identify the customer network device that sent the loop avoidance protocol packet, the modifying creating the modified loop avoidance protocol packet;

- appending to the modified loop avoidance protocol packet information identifying the apparatus; and

- flooding the modified loop avoidance protocol packet to the one or more ports of the apparatus that are coupled to the provider network.

40. (New) The apparatus of claim 38 wherein the module is further configured to:

- if the port is not coupled to the customer network, process the loop avoidance protocol packet based on a provider loop avoidance protocol instance associated with the port.

41. (New) The apparatus of claim 38 wherein the loop avoidance protocol packet comprises a bridge protocol data unit (BPDU).

42. (New) The apparatus of claim 38 wherein
the provider loop avoidance protocol instance comprises a first spanning tree protocol (STP)
instance; and
the customer loop avoidance protocol instance comprises a second STP instance.
43. (New) The apparatus of claim 38 wherein the module is further configured to flood the
modified loop avoidance protocol packet by tunneling the modified loop avoidance protocol
packet to the root bridge.
44. (New) The apparatus of claim 39 wherein the appending further comprises appending one
or more of:
a payload type;
a port ID corresponding to the port of the provider network device; and
an address of the provider network device.
45. (New) The apparatus of claim 38 wherein the module is further configured to:
if the loop avoidance protocol packet indicates a topology change, enable fast-aging of
learned network device addresses.
46. (New) An apparatus comprising:
a memory; and
a module configured to:
receive a first packet at a first port of the apparatus, apparatus configured to perform
packet switching and coupled to a provider network, the first packet comprising a
loop avoidance protocol packet and identifying a second provider network device
that received the loop avoidance protocol packet from a customer network, the first
packet identifying a customer network device that sent the loop avoidance protocol
packet;

if the apparatus is not a root bridge for the provider network, flood the first packet to one or more ports of the apparatus that are coupled to the provider network; and
if the apparatus is the root bridge for the provider network, process the loop avoidance protocol packet based on a customer loop avoidance protocol instance associated with a second port of the second provider network device that received the loop avoidance protocol packet from the customer network.

47. (New) The apparatus of claim 46 wherein the module is further configured to indicate an error if the first port is coupled to the customer network.
48. (New) The apparatus of claim 46 wherein the loop avoidance protocol packet comprises a bridge protocol data unit (BPDU).
49. (New) The apparatus of claim 46 wherein the customer loop avoidance protocol instance comprises a spanning tree protocol (STP) instance.
50. (New) The apparatus of claim 46 wherein the module is configured to flood the first packet to one or more ports of the apparatus that are coupled to the provider network by tunneling the first loop avoidance protocol packet to the root bridge.
51. (New) The apparatus of claim 46 wherein the loop avoidance protocol packet comprises: a destination address identifying a customer network device; and
a payload portion comprising information identifying the second provider network device that received the loop avoidance protocol packet from the customer network, the information comprising:
a payload type;
a port ID corresponding to the second port; and
an address of the second provider network device.
52. (New) An apparatus comprising:

means for receiving a loop avoidance protocol packet at a port of a provider network device configured to perform packet switching; and

means for, if the port is coupled to a customer network:

if the device is a root bridge for the provider network, processing the loop avoidance protocol packet based on a customer loop avoidance protocol instance associated with the port; and

if the device is not the root bridge for the provider network, flooding a modified loop avoidance protocol packet to one or more ports of the provider network device that are coupled to the provider network, the modified loop avoidance protocol packet identifying the provider network device and a customer network device that sent the loop avoidance protocol packet.

53. (New) An apparatus comprising:

means for receiving a first packet at a first port of a first provider network device configured to perform packet switching, the first packet comprising a loop avoidance protocol packet and identifying a second provider network device that received the loop avoidance protocol packet from a customer network, the first packet identifying a customer network device that sent the loop avoidance protocol packet;

means for, if the first provider network device is not a root bridge for the provider network, flooding the first packet to one or more ports of the provider network device that are coupled to the provider network; and

means for, if the first provider network device is the root bridge for the provider network, processing the loop avoidance protocol packet based on a customer loop avoidance protocol instance associated with a second port of the second provider network device that received the loop avoidance protocol packet from the customer network.

54. (New) A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method, the method comprising: receiving a loop avoidance protocol packet at a port of a provider network device configured to perform packet switching; and

if the port is coupled to a customer network:

if the device is a root bridge for the provider network, processing the loop avoidance protocol packet based on a customer loop avoidance protocol instance associated with the port; and

if the device is not the root bridge for the provider network, flooding a modified loop avoidance protocol packet to one or more ports of the provider network device that are coupled to the provider network, the modified loop avoidance protocol packet identifying the provider network device and a customer network device that sent the loop avoidance protocol packet.

55. (New) A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method, the method comprising:
- receiving a first packet at a first port of a first provider network device configured to perform packet switching, the first packet comprising a loop avoidance protocol packet and identifying a second provider network device that received the loop avoidance protocol packet from a customer network, the first packet identifying a customer network device that sent the loop avoidance protocol packet;
- if the first provider network device is not a root bridge for the provider network, flooding the first packet to one or more ports of the provider network device that are coupled to the provider network; and
- if the first provider network device is the root bridge for the provider network, processing the loop avoidance protocol packet based on a customer loop avoidance protocol instance associated with a second port of the second provider network device that received the loop avoidance protocol packet from the customer network.